

REMARKS

The pending claims are claims 1-11. Claims 1 to 3 are directed to a polymer composition which is crosslinkable with ultraviolet rays. The polymer composition comprises a polymer containing 0.001 to 10% by weight of iodine, a photoinitiator as a crosslinking agent and a polyfunctional unsaturated compound as a crosslinking aid.

Claims 4, 5 and 7-10 are directed to either a crosslinked article or gasket obtained by subjecting the ultraviolet-crosslinkable polymer composition to ultraviolet irradiation. Claims 6 and 11 are directed to a fluorine-containing polymer coating material comprising the ultraviolet-crosslinkable polymer composition.

In the present invention, by using a photoinitiator as a crosslinking agent and a polyfunctional unsaturated compound as a crosslinking agent with the polymer containing iodine, crosslinking with ultraviolet rays becomes possible and application in a working site at a low temperature is facilitated. As described at page 9, lines 5-6 of the specification, by using a polymer containing iodine, the crosslinking reaction tends to easily occur, in comparison to a polymer containing bromine.

Claims 1-11 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 6,346,300 to Ruepping. The grounds for rejection remain the same as set forth in the previous Office Action.

Applicants traverse, and respectfully request the Examiner to reconsider in view of the Declaration under 37 C.F.R. § 1.32 of Etsuo Minamino submitted herewith and the following remarks.

Ruepping discloses a fluoroelastomer composition comprising an elastomer containing brominated olefin, a multi-functional crosslinking agent and a photoinitiator. The Examiner considered that a polymer composition obtained by polymerizing an iodine-containing cure site monomer would be anticipated by Ruepping.

However, although Ruepping describes the possibility of copolymerizing a monomer containing bromine or iodine, only a bromine-containing monomer is actually discussed. In fact, none of the 22 working examples of Ruepping describes a polymer composition meeting the terms of present claim 1. Therefore, it is respectfully submitted that the present claims are not anticipated by Ruepping.

Applicants further comment on patentability of the present claims over Ruepping as follows.

Aside from the above, Ruepping also does not recognize or otherwise disclose the advantage of employing a polymer containing iodine to thereby promote the crosslinking reaction as compared to one containing bromine. In this regard, as shown by the comparative test data in the attached Declaration, when a copolymer composition comprising an iodine-containing polymer is crosslinked by ultraviolet rays, the resulting properties such as tensile strength, elongation and 100% modulus (M100) are remarkably superior as compared to those of a polymer composition comprising a bromine-containing polymer which is crosslinked by ultraviolet rays. The reason therefore is that iodine atom is far superior to bromine atom in terms of efficiency as a crosslinking reaction site.

The above applies not only for photopolymerization using a photoinitiator as the crosslinking agent, but also for peroxide crosslinking (thermal crosslinking) using a peroxide as the crosslinking agent. When a composition containing a bromine-containing polymer is crosslinked by a peroxide, properties such as tensile strength are insufficient and usually, in order to trap hydrofluoric acid that is generated under high temperature, an acid acceptor such as magnesium oxide and calcium hydroxide is added to the composition. In such case, the same properties as those obtained when an iodine-containing polymer is used can be maintained.

However, in the photopolymerization, an acid acceptor cannot be added to the composition. This is because light does not sufficiently permeate and photopolymerization does not occur with addition of an acid acceptor. Therefore, when conducting photopolymerization, even if a polymer composition comprising a bromine-containing polymer is crosslinked, the same properties as those of an iodine-containing polymer cannot be maintained.

Consequently, when a polymer composition comprising an iodide-containing polymer is crosslinked by ultraviolet rays, the properties of the crosslinked article thus obtained differ, in an unobvious way, from those of a polymer composition comprising a bromine-containing polymer. Moreover, Ruepping certainly does not disclose the crosslinked article or gasket obtained by subjecting the ultraviolet-crosslinkable polymer composition comprising a polymer containing iodine to ultraviolet irradiation as claimed in claims 4, 5 and 7-10.

For the above reasons, it is respectfully submitted that the present claims are neither anticipated nor obvious over Ruepping, and withdrawal of the foregoing rejection is respectfully requested.

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Claims 1-4, 8 and 11 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent 5,169,902 to Yagi et al, as evident by JP 59-28310 (JP '310) or JP 53-125491(JP '491). The grounds for rejection remain the same as set forth in the previous Office Action. Namely, Example 1 of Yagi et al was cited as disclosing a composition comprising a polyfunctional acrylate, a photoinitiator, and an iodine-containing fluoroelastomer.

Applicants respectfully traverse for the following reasons.

In Example 1 of Yagi et al, camphorquinone is used as a photoinitiator. However, as evident from the description "irradiated with visible rays for photopolymerization", camphorquinone is used for polymerization of methylmethacrylate and not for crosslinking. Also, after photopolymerization, as evident from the description "heat-treated as 160°C for 10 minutes to crosslink the rubber", conventional thermal crosslinking is conducted and crosslinking by ultraviolet rays is not conducted. Consequently, the present invention differs from Yagi et al in that Yagi et al does not disclose a crosslinked article obtained by subjecting an iodine-containing polymer to ultraviolet irradiation as required by the present invention.

For the above reasons, it is respectfully submitted that claims 1-4, 8 and 11 are not anticipated by Yagi et al, and withdrawal of the foregoing rejection under 35 U.S.C. § 102(b) is respectfully requested.

Withdrawal of all rejections and allowance of claims 1-11 is earnestly solicited.

In the event that the Examiner believes that it may be helpful to advance the prosecution of this application, the Examiner is invited to contact the undersigned at the local Washington, D.C. telephone number indicated below.

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Respectfully submitted,



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